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ABSTRACT

The capabilities and hardware requirements of four microcomputer software packages produced by the Office of Educational Testing, Research and Service at the University of Illinois at Urbana-Champaign are described. These programs are: (1) the Scan-Tron Forms Analysis Package Version 2.0, an interface between an IBM-compatible and a Scan-Tron Forms Reader, which is capable of interpreting Scan-Tron answer forms; (2) the Test Analysis Package Version 2.0, which can perform statistical manipulations on student response data; (3) the Student-Problem Package Version 1.0, which can analyze item response patterns of student test data; and (4) the Item Bank Package, a comprehensive test preparation package that allows a teacher to create a pool of questions and combine them into tests. Annotated output from each program is included. (MES)

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MICROCOMPUTER APPLICATIONS IN LOCAL ASSESSMENT SYSTEMS

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Descriptions of Software Packages Produced by the Office of Educational Testing, Research, and Services

Introduction

We, at the Office of Educational Testing, Research, and Service, are committed to helping educators use their computers effectively. To this end, we are always available for comments, suggestions, and most importantly, questions. Feedback from you is what helps us to improve our product. Every package we sell comes with the commitment to make sure that the end user can use it to his or her greatest benefit. This means that in addition to a thoughtfully written user manual, you will receive our service commitment. The original authors of these programs are on hand to answer your questions. Simply contact the OETRS at (217) 333-4585.

If you see a product that interests you, but does not quite fit your need, or just have an unfulfilled need, call us. Custom modifications and programs are part of our effort to make sure everyone has the computer software that he or she needs.

For more information on any of these packages, contact:

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The Scan-Tron Forms Analysis Package Version 2.0 (SFAP)

The Scan-Tron Forms Analysis Package is designed to be an interface between an IBM-compatible computer and a Scan-Tron Model 1200 or 2100 Forms Reader. It is currently capable of interpreting thirteen different Scan-Tron answer forms. Additional forms may be recognized either through the use of the included "Add a Form" utility, or by custom modification at the Office of Testing, Research and Services.

The SFAP takes the data from answer sheets and converts it into either Alphabetic (A-E) or Numeric (1-5) format, and then places the answers into an ASCII text file, suitable for use with either the Test Analysis Package (TAP), or with the Student Problem Package (SPP), or any other statistical package that

accepts ASCII input. Other features include automatic "Key" file creation with supported forms, the ability to view created data files, the ability to print data files on a standard line printer, a conversion program to place the data in an 80-column format, suitable for use with mainframe statistical packages, and even a utility to format a disk without leaving the program.

The Scan-Tron Forms Analysis Package is an easy to use bridge between student test responses and computerized statistical analysis.

REQUIREMENTS:
IBM-PC, XT, AT, XT/286, PS/2 OR 100% COMPATIBLE
256K INTERNAL MEMORY
1 FLOPPY DISK (A HARD DISK IS RECOMMENDED)
ONE ASYNCHRONOUS SERIAL COMMUNICATIONS PORT
DOS 2.0 OR GREATER (3.2 IS RECOMMENDED)
A SCANTRON MODEL 1200 OR 2100 FORMS READER

The Test Analysis Package Version 2.0 (TAP)

The Test Analysis Package is an easy to use program that takes student responses that have been prepared either with the Scan-Tron Forms Analysis Package, or with TAP's in-line editor, or with any other ASCII text editor, and performs several statistical manipulations on that data.

The Test Analysis Package performs automatic test scoring, and then provides vital information on those scores such as average score, standard deviation, item difficulty, and reliability coefficient. At the request of the user, it will also include a breakdown of correct answers per item by quintile, in both numeric and graphic format, and point-biserial distribution. All of this information can be either displayed on the computer, or printed out to a printer.

Version 2.0 of the Test Analysis Package also provides for analysis by category, or content domain. Certain items may be grouped together, all of the items dealing with mathematics, for instance, and the above analysis can be run on these skills, with such added information as number of skills mastered per student, number of students mastering a skill, skill difficulty, reliability coefficient by skill, and graphical display of percentage of students mastering each skill.

The Test Analysis Package is an ideal statistical tool for measuring the validity of entire tests, individual items, and specific content domains.

REQUIREMENTS:
IBM-PC, XT, AT, XT/286, PS/2 OR 100% COMPATIBLE
256K INTERNAL MEMORY (MORE MEMORY IS RECOMMENDED)
1 FLOPPY DISK (A HARD DISK IS STRONGLY RECOMMENDED)
DOS 2.0 OR GREATER

The Student-Problem Package Version 1.0 (SPP)

The Student-Problem Package is designed to analyze the item response patterns of student test data. It provides analyses of response patterns of students as well as for items. Analyzing the patterns of correct/incorrect responses may reveal important information about students' preparation as well as about the validity of certain items.

Response patterns for students can be unusual in that some students answer some easy items incorrectly while answering some more difficult items correctly. Response patterns for items may be unusual in that items which are answered incorrectly by high scoring students are answered correctly by low scoring students.

This information is graphically displayed by SPP in the form of an SP chart. This chart contains the students' score, percentage correct, correct/incorrect responses to every item, and two additional items which help classify the student: a modified caution index score, and an achievement level based on the students' percentage correct and modified index score. The modified index score indicates the degree to which a student's response behavior matches that of the norm; a .00 indicates absolute predictability while a 1.00 represents absolute unpredictability. This score is what allows evaluators to gauge a student's relative performance. The achievement level is based on both the modified caution index and the percentage score, and can be one of four values: high score, low modified caution index (MCI); high score, high MCI; low score, low MCI; low score, high MCI.

Additional options include automatic test scoring, the ability to print results on the screen or to a printer, and additional analysis options such as ability to divide the test into categories, and the ability to draw S and P curves on the graph. The S & P curves represent the Student and Problem patterns, respectively, and indicate to what degree student behavior matched item behavior. In an ideal test, the S & P curves would be identical. This display is useful in showing where the two curves do not coincide. This information, taken together with the previous data, can provide a comprehensive evaluation of the learning process, how well a test "tested" that learning, and, more importantly, how well the students learned.

Version 2.0 of SPP (available this fall) will incorporate full category and content domain analysis.

REQUIREMENTS:
IBM-PC, XT, AT, XT/286, PS/2 OR 100% COMPATIBLE
256K INTERNAL MEMORY (MORE MEMORY IS RECOMMENDED)
1 FLOPPY DISK (A HARD DISK IS STRONGLY RECOMMENDED)
DOS 2.0 OR GREATER

Item Bank Package (ITEMBANK)

Itembank is a comprehensive test preparation package that allows a teacher to create a pool of questions and then combine them into tests. The Item Bank Package is a comprehensive item bank, that can accommodate True/False, Multiple

4

Choice, Short Answer and Essay Questions. An answer key can also be kept. Content domains and behavior categories exist for item classification. Items and tests are displayed on the screen in the same format as they are printed. Statistical data is scored for each item and with each test enabling performance on tests to be predicted. Stored items can be selectively incorporated into a test and a powerful editor allows for easy manipulation of tests. Test questions are automatically numbered, even if the order of the questions changes. Multiple forms of the same test can be easily created by scrambling questions manually or automatically. Tests and answer keys can easily be printed or displayed. Cross references between different forms of the same test can be generated automatically.

Of course, the item bank package is easy to use, with a common-sense in-line editor, and automatic test generation. The item bank package is useful for anyone who wants to have access to original, quality, printed tests at the push of a button.

REQUIREMENTS:
IBM-PC, XT, AT, XT/286, PS/2 OR 100% COMPATIBLE
256K INTERNAL MEMORY (MORE MEMORY IS RECOMMENDED)
1 FLOPPY DISK (A HARD DISK IS STRONGLY RECOMMENDED)
DOS 2.0 OR GREATER

The Scan-Tron Forms Analysis Package Version 2.0 (SFAP)

Delwyn L. Harnisch
Brian Malcolm

The Scan-Tron Forms Analysis Package is designed to be an interface between an IBM-compatible computer and a Scan-Tron Model 1200 or 2100 Forms Reader. SFAP is a collection of programs which allow an IBM-PC compatible computer to collect and view data from a Scan-Tron Forms Reader. Currently, SFAP can read thirteen different Scan-Tron answer forms. Additional forms may be recognized either through the use of the included "Add a Form" utility, or by custom modification at the Office of Educational Testing, Research and Services.

SFAP was desgined spcifically for the transer of information from paper to computer. SFAP takes the data from answer sheets and converts it into either Alphabetic (A-E) or Numeric (1-5) format, and then places the answers into an ASCII text file, suitable for use with many statistical software packages, including the Test Analysis Package (TAP), the Student Problem Package (SPP), or any other statistical package that accepts ASCII input.

Answer Keys can be automatically created with supported forms simply by marking the "key" bubble. Data can be viewed either on the screen, or by printing the data on a line printer. Data can be converted to an 80-column card format which is suitable for transferring to a mainframe. Blank disks may even be formatted without leaving the program.

The Main Menu shows both the versatility and the ease of use of this program:

```
                Scan-Tron Forms Analysis Package

                1. Read Forms

                2. View a Data File

                3. Print a Data File

                4. Create a Formatted Data File

                5. View a Formatted Data File

                6. Print a Formatted Data File

                7. Format a New Data Disk

                8. Add a Form

                9. Exit the Program
To Use:
  UP and DOWN keys to chose an option, then press RETURN
  or type the number next to the item.
```

Options can be selected with the arrow keys, or by number, helping both beginner and expert. Currently, thirteen forms are supported by SFAP, as can be seen from the following program screen:

```
Form Parameters:

  Form Number: _____      Number of Passes: _
  Length of ID: __        Number of Columns per Pass: _
  Number of Items: ___    Bubbles per Item: _  Response type: ___

================================================================
              Form formats currently supported:

   Choice     Form #          Choice     Form #
     1.         882             8.       21100
     2.         2020            9.       22000
     3.         2052           10.       2097C
     4.         2052N          11.       20012
     5.         2054           12.       2001B
     6.         2054N          13.       22733
     7.         2200

     Please choose a form: __

  Scan-Tron Forms Analysis Package   --  Scan-Tron Forms Reader
```

Simply choose a form, select the parameters, and you're ready to go!

The Scan-Tron Forms Analysis Package is an easy to use bridge between student test responses and computerized statistical analysis.

Requirements:
IBM-PC, XT, AT, XT/286, ps/2 or 100% compatible
256k internal memory
1 floppy disk (a hard disk is recommended)
One asynchronous serial communications port
DOS 2.0 or greater (3.2 is recommended)
a Scantron model 1200 or 2100 forms reader

Test Analysis Package (TAP):

A Microcomputer Questionaire and Test Analysis Program

Delwyn L. Harnisch
Brian Malcolm
Jeff Horwitz
Lih-Shing Wang

The Test Analysis Package (TAP) consists of four microcomputer programs which edit, score, summarize, and analyze student test data. Some of the powerful features of the TAP system include:

* A built-in editor which allows the user to create a student test data file without having to use a seperate word processor.

* A scoring mechanism which can score a test data file of 999 students and 274 items against either a stored answer key or one created by the user.

* A program which allows the user to divide the test into objectives or content domains, and perform TAP Analysis based on objective mastery.

* A report generator which summarizes the descriptive statistics for students, items, and the test, and produces a frequency distribution of test scores.

* A system utility which allows the user to select a subset of the total test items for inclusion in the item analysis, thus helping the user to generate the best possible test.

The versatility of the TAP system, however, is not gained at the expense of ease of operation. No programming experience or extensive computer knowledge is assumed in order to use the system.

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Requirements:
IBM-PC, XT, AT, XT/286, PS/2 or 100% compatible
256k internal memory (more memory is recommended)
1 floppy disk (a hard disk is strongly recommended)
DOS 2.0 or greater

TAP Analysis File: C:CMPA.DTA DATE: 09-11-1987

STUDENT TEST SCORES

number of correct items

% of items correct

STUDENT ID NO.	SCORE	PERCENT CORRECT
2002	40	58
2003	50	72
2004	50	72
2005	57	83
2007	37	54
2008	53	77
2009	51	74
2010	48	70
2012	56	81
2013	49	71
2014	49	71
2015	53	77
2016	46	67
2017	39	57
2018	59	86
2019	38	55
2020	53	77
2021	52	75
2022	46	67
2023	51	74
2024	42	61
2025	42	61
2026	42	61
2027	37	54
2028	41	59
2029	53	77
2030	46	67
2031	49	71
2032	51	74
2033	58	84
2034	39	57
2035	59	86
2036	57	83
2037	53	77
2038	46	67
2039	47	68
2040	52	75
2042	54	78
2043	37	54
2045	49	71
2046	53	77
2047	60	87
2048	37	54
2049	56	81
2050	55	80
2051	46	67
2052	47	68
2053	58	84
2054	48	70
2055	48	70
2056	49	71
2057	58	84
2058	47	68
2059	40	58
2060	53	77
2061	50	72
2062	46	67
2063	54	78
2064	53	77
2065	55	80
2066	52	75
2067	42	61
2068	53	77
2070	40	58
2071	52	75
2072	38	55
2073	53	77
2074	39	57
2075	48	70
2076	37	54
2077	37	54
2078	44	64
2079	39	57
2080	60	87
2081	48	70
2082	54	78
2083	55	80
2084	55	80
2085	45	65
2086	56	81
2087	44	64
2088	48	70
2089	56	81
2090	56	81
2091	50	72
2092	37	54
2093	51	74
2094	50	72
2095	61	88
2096	46	67
2097	49	71
2098	54	78
2099	49	71
2100	52	75
2101	51	74
2102	50	72
2103	48	70
2104	48	70
2105	57	83
2106	41	59

TAP Analysis File: C:CMPA.DTA DATE: 09-11-1987

STUDENT SUMMARY

number of test items included in total scores

NUMBER OF TEST ITEMS	=	69
AVG. TEST SCORE	=	48.80 (average raw score)
STD. DEV. OF TEST SCORE	=	6.61
STD. ERROR OF MEAN	=	0.61
SKEWNESS	=	-0.19
KURTOSIS	=	2.22
NUMBER OF TEST SCORES	=	119 (number of students)

ITEM SUMMARY

average proportion of students getting an item correct

AVG. ITEM DIFFICULTY	=	0.71
STD. DEV. OF ITEM DIFFICULTY	=	0.18

TEST SUMMARY

RELIABILITY COEF. (KR-20) = 0.74

a measure of internal consistency for the selected test items

FREQUENCY DISTRIBUTION OF TEST SCORES

mean of 500 and sd. of 100

one student with score of 64

four students scored 58

number of students scoring 42 or lower

RAW SCORE	STANDARDIZED SCORE	FREQ	CUM FREQ	EACH * REPRESENTS 1 PERSON
64	730	1	119	*
63	715	0	118	
62	700	0	118	
61	684	1	118	*
60	669	2	117	**
59	654	3	115	***
58	639	4	112	****
57	624	3	108	***
56	609	5	105	*****
55	594	7	100	*******
54	579	4	93	****
53	564	10	89	**********
52	548	5	79	*****
51	533	5	74	*****
50	518	7	69	*******
49	503	8	62	********
48	488	8	54	********
47	473	5	46	*****
46	458	9	41	*********
45	443	2	32	**
44	427	3	30	***
43	412	0	27	
42	397	6	27	******
41	382	3	21	***
40	367	3	18	***
39	352	4	15	****
38	337	3	11	***
37	322	7	8	*******
36	307	0	1	
35	291	1	1	*

QUINTILE FREQUENCY DISTRIBUTION OF TEST SCORES

QUINTILE	NO. OF SCORES	PROPORTION OF SCORES	SCORE RANGE
1ST	21	0.18	35 - 41
2ND	25	0.21	42 - 47
3RD	23	0.19	48 - 50
4TH	24	0.20	51 - 54
5TH	26	0.22	55 - 64

the bottom 20% (approx) of the total test score distribution

range of total scores in the bottom quintile

the top 20% (approx)

# of students in the top quintile

TAP Analysis File: C:CMPA.DTA DATE: 09-11-1987

*** ITEM 69 ***

FREQUENCY OF RESPONSES BY QUINTILES

RESPONSE OPTION	QUINTILE 1ST	2ND	3RD	4TH	5TH	PROP.OF RESPONSE
1*	8	11	10	11	18	0.49
2	0	1	0	1	2	0.03
3	12	13	12	12	6	0.46
4	0	0	1	0	0	0.01
OMIT	1	0	0	0	0	0.01

* INDICATES CORRECT RESPONSE

number of students in bottom quintile choosing each option

proportion of all students choosing each option

*** ITEM 70 ***

FREQUENCY OF RESPONSES BY QUINTILES

RESPONSE OPTION	QUINTILE 1ST	2ND	3RD	4TH	5TH	PROP.OF RESPONSE
1	2	0	1	0	0	0.03
2*	8	17	18	22	25	0.76
3	7	5	2	1	0	0.13
4	4	3	2	1	1	0.09
OMIT	0	0	0	0	0	0.00

* INDICATES CORRECT RESPONSE

the lower the total score, the more attractive this distractor

*** ITEM 71 ***

FREQUENCY OF RESPONSES BY QUINTILES

RESPONSE OPTION	QUINTILE 1ST	2ND	3RD	4TH	5TH	PROP.OF RESPONSE
1	0	1	1	0	0	0.02
2*	11	16	18	21	24	0.76
3	1	3	2	0	0	0.05
4	9	5	2	3	2	0.18
OMIT	0	0	0	0	0	0.00

* INDICATES CORRECT RESPONSE

item discrimination index (for correct options only)

the higher the total score, the more attractive the option

POINT-BISERIAL CORRELATIONS BETWEEN RESPONSE OPTIONS AND TOTAL TEST SCORE

ITEM #	RESPONSE OPTION 1	2	3	4	OMI
66	-0.13	0.17*	-0.10	-0.07	0.0
67	-0.17	0.00	-0.09	0.17*	0.0
68	0.24*	-0.26	0.02	-0.10	0.0
69	0.21*	0.10	-0.23	0.02	-0.1
70	-0.17	0.45*	-0.37	-0.16	0.0
71	-0.04	0.36*	-0.13	-0.31	0.0
72	-0.20	0.07	-0.16	0.14*	0.0
73	0.06	-0.17	0.18*	-0.08	0.0
74	-0.01	-0.06	0.35*	-0.36	0.0
75	-0.19	0.38*	-0.12	-0.28	0.0
76	-0.11	-0.09	-0.35	0.38*	0.0
77	-0.11	-0.11	0.31*	-0.27	0.0
78	-0.24	0.38*	-0.13	-0.25	0.0
79	-0.03	-0.10	0.11*	-0.03	0.0
80	-0.01	0.24*	-0.10	-0.23	0.0
81	0.36*	-0.26	-0.03	-0.15	0.0
82	-0.07	0.03*	0.00	-0.01	0.0
83	-0.12	0.21*	0.03	-0.21	0.0
84	0.10*	-0.00	-0.03	-0.13	0.0
85	-0.19	0.32*	-0.14	-0.21	0.0
86	-0.24	-0.07	0.42*	-0.31	0.0
87	0.24*	-0.13	-0.02	-0.23	0.0
88	-0.27	-0.14	-0.09	0.31*	0.0
89	-0.13	-0.02	-0.05	0.11*	0.0
90	-0.22	-0.10	0.23*	-0.08	0.0
91	0.29*	-0.10	-0.29	-0.02	0.00
92	0.25*	-0.12	-0.12	-0.17	0.00
93	0.10*	-0.10	-0.01	-0.07	0.00
94	-0.24	0.27*	-0.04	-0.17	0.00
95	0.06	0.17*	-0.20	-0.11	-0.14
96	0.09	0.00	-0.29	0.17*	0.0
97	-0.05	0.07	-0.28	0.11*	0.0
98	0.03*	0.18	-0.25	-0.14	0.0
99	-0.13	0.12*	-0.19	0.11	0.0
100	-0.08	-0.34	-0.18	0.34*	0.0
101	-0.06	-0.13	-0.11	0.19*	0.0
102	-0.18	-0.04	0.35*	-0.12	0.0
103	-0.07	0.28*	-0.19	-0.17	0.0
104	-0.02	-0.11	0.23*	-0.26	0.0
105	-0.09	0.07	-0.26	0.22*	0.0
106	0.03	-0.10	-0.20	0.18*	0.0
107	-0.16	0.20*	-0.17	-0.08	0.0
108	-0.02	0.11*	-0.13	0.00	0.0
109	0.20*	-0.07	-0.24	0.08	0.00
110	0.21*	-0.20	0.00	-0.07	0.00

* INDICATES CORRECT RESPONSE OPTION

OBJECTIVE ANALYSIS

TAP Skill Analysis File: C:cmpa.dta DATE: 10-04-1987

KEY TO OBJECTIVE NUMBERS

OBJECTIVE NUMBER	NAME	TOTAL ITEMS	ITEMS NEEDED FOR MASTERY	ITEM #'s
1	Topic A	14	9	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15
2	Topic B	14	9	16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
3	Topic C	13	8	31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 43, 44, 45
4	Topic D	15	10	46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60
5	Topic E	15	10	61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75
6	Topic F	15	10	76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90
7	Topic G	15	10	91, 92, 93, 94, 95, 96, 97, 98, 99, 100,101,102,103,104,105
8	Topic H	15	10	106,107,108,109,110,111,112,113,114, 115,116,117,118,119,120
9	Topic I	14	9	121,123,124,125,126,127,128,129,130, 131,132,133,134,135

items 14 and 19, among others, are excluded from analyses

number of items included in topic I (objective 9)

number of correct items needed to master objective 9

items included in objective 9

TAP Skill Analysis File: C:cmpa.dta DATE: 10-04-1987

STUDENT SCORES BY OBJECTIVE NUMBER

STUDENT ID	TOTAL (% OF) SKILLS MASTERED	OBJECTIVE SCORES (* = MASTERY) 1	2	3	4	5	6	7	8	9
2002	2(22.2)	6	6	8*	6	7	8	9	11*	7
2003	5(55.6)	5	7	9*	11*	8	8	11*	15*	11*
2004	4(44.4)	8	5	8*	7	9	9	11*	14*	9*
2005	9(100.0)	10*	10*	11*	10*	12*	13*	10*	12*	12*
2007	2(22.2)	3	9*	8*	8	7	8	7	9	8
2008	6(66.7)	9*	7	7	10*	13*	9	10*	13*	12*
2009	5(55.6)	9*	7	9*	9	9	13*	11*	12*	8
2010	7(77.8)	10*	9*	10*	10*	9	10*	9	13*	9*
2012	9(100.0)	11*	12*	10*	12*	13*	14*	11*	12*	10*
2013	8(88.9)	9*	7	8*	12*	11*	10*	10*	11*	10*
2014	9(100.0)	11*	10*	10*	12*	10*	10*	10*	12*	11*
2015	7(77.8)	11*	8	11*	12*	12*	9	13*	13*	9*
2016	5(55.6)	9*	6	7	10*	11*	10*	9	11*	8
2017	1(11.1)	6	7	6	7	6	8	10*	8	8
2018	9(100.0)	11*	11*	11*	12*	13*	12*	13*	13*	12*
2019	2(22.2)	9*	8	4	9	9	6	8	10*	8
2020	7(77.8)	12*	7	9*	12*	11*	8	11*	13*	12*
2021	5(55.6)	7	7	7	10*	12*	11*	12*	12*	7
2022	6(66.7)	10*	8	10*	13*	10*	8	11*	12*	7
2023	5(55.6)	5	8	8*	11*	8	11*	9	13*	11*
2024	3(33.3)	10*	6	7	10*	7	9	8	11*	8
2025	5(55.6)	4	8	8*	10*	9	5	10*	10*	10*
2026	1(11.1)	8	6	6	5	9	10*	8	9	7
2027	2(22.2)	7	7	8*	9	9	7	8	10*	6
2028	3(33.3)	5	9*	7	9	9	10*	10*	8	6
2029	9(100.0)	9*	9*	13*	12*	11*	13*	11*	11*	9*
2030	5(55.6)	11*	8	6	8	10*	8	10*	12*	9*
2031	5(55.6)	9*	8	7	7	9	12*	10*	12*	9*
2032	7(77.8)	9*	9*	5	10*	10*	11*	10*	13*	8
2033	9(100.0)	10*	9*	9*	11*	12*	10*	14*	14*	11*
2034	1(11.1)	7	7	6	6	8	8	11*	9	6
2035	9(100.0)	13*	12*	12*	13*	13*	11*	12*	13*	13*
2036	9(100.0)	12*	10*	9*	15*	11*	12*	13*	13*	10*
2037	8(88.9)	11*	8	11*	11*	11*	12*	11*	13*	10*
2038	6(66.7)	7	8	11*	12*	10*	9	10*	11*	9*
2039	6(66.7)	11*	5	8*	10*	9	8	13*	10*	10*
2040	8(88.9)	6	10*	11*	11*	11*	11*	12*	13*	9*
2042	8(88.9)	12*	12*	8*	12*	11*	13*	9	13*	11*
2043	5(55.6)	5	7	8*	10*	10*	3	12*	10*	6
2045	5(55.6)	8	12*	9*	7	9	11*	9	13*	10*
2046	7(77.8)	10*	9*	6	11*	8	10*	12*	12*	12*
2047	9(100.0)	11*	10*	10*	11*	10*	12*	13*	14*	13*
2048	3(33.3)	7	9*	9*	9	7	5	8	11*	8
2049	9(100.0)	12*	11*	9*	14*	11*	12*	11*	13*	11*
2050	9(100.0)	12*	10*	8*	12*	11*	12*	12*	12*	12*

number of objectives mastered

this student got 8 items correct in objective 3, which is at the standard for mastery

this student got 7 items correct in objective 7, less than the 10 needed for mastery

it is possible to see that if the standard for mastery was changed from 10 to 9, eleven more students would master this objective

OBJECTIVE LEGEND

1= Topic A
2= Topic B
3= Topic C
4= Topic D
5= Topic E
6= Topic F
7= Topic G
8= Topic H
9= Topic I

TAP Skill Analysis File: C:cmpa.dta DATE: 10-04-1987
OBJECTIVE SUMMARIES

average raw score for objective one

measure of the confidence in the group mean (the smaller, the better)

shape of distribution is close to 'normal' (0.0)

internal consistency for the selected items in each objective

OBJECTIVE NUMBER	AVG. OBJ. SCORE	STD. DEV.	STD. ERROR OF MEAN	SKEW-NESS	KUR-TOSIS	# OF STU-DENTS MAS-TERING	% OF STU-DENTS MAS-TERING	AVG. ITEM DIFFI-CULTY	STD. DEV.OF ITEM DIFF.	RELIA-BILITY COEF. (KR-20)
1	8.71	2.38	0.22	-0.23	2.36	66	55.5	0.62	0.20	0.55
2	7.89	2.00	0.18	-0.04	3.48	44	37.0	0.56	0.23	0.33
3	8.74	1.89	0.17	-0.12	2.54	89	74.8	0.67	0.20	0.37
4	10.06	2.09	0.19	-0.17	2.45	74	62.2	0.67	0.22	0.42
5	9.87	1.74	0.16	-0.19	2.18	72	60.5	0.66	0.26	0.22
6	9.81	2.18	0.20	-0.37	3.05	70	58.8	0.65	0.15	0.38
7	10.11	1.93	0.18	-0.10	2.41	75	63.0	0.67	0.20	0.28
8	11.97	1.60	0.15	-0.52	3.09	109	91.6	0.80	0.17	0.23
9	9.53	2.00	0.18	-0.09	2.23	81	68.1	0.68	0.20	0.39

measure of the distance between scores

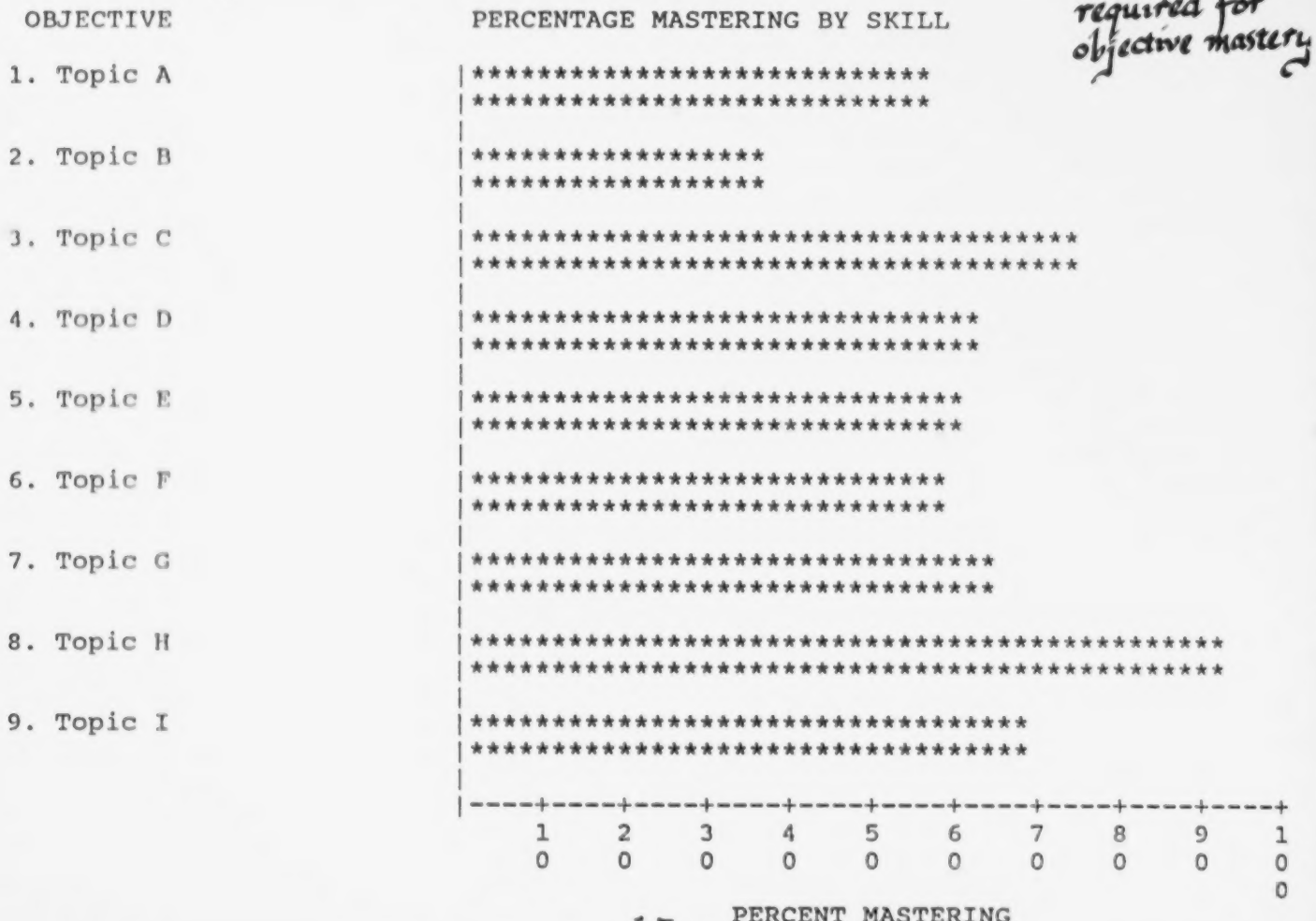
height of distribution is close to 'normal' (3.0)

since this is so high, more items could be required for objective mastery

TAP Skill Analysis File: C:cmpa.dta DATE: 10-04-1987 PAGE - 6

pictorial representation

HISTOGRAM OF PERCENTAGE MASTERING EACH SKILL



TAP Skill Analysis File: C:cmpa.dta DATE: 10-04-1987

QUINTILE FREQUENCY DISTRIBUTION
OF OBJECTIVE MASTERY SCORES

QUINTILE	NO. OF SCORES	PROPORTION OF SCORES	SCORE RANGE
1ST	17	0.14	1 - 2
2ND	21	0.18	3 - 4
3RD	28	0.24	5 - 6
4TH	18	0.15	7 - 7
5TH	35	0.29	8 - 9

bottom 20% (approx) of the objective mastery distribution

range of the number of objectives mastered in the bottom quintile

number of students in the top quintile

PERCENT MASTERING
OBJECTIVES BY QUINTILES

OBJECTIVE NUMBER	1ST	2ND	3RD	4TH	5TH
1	12	14	46	89	91
2	6	19	18	39	77
3	41	67	75	72	97
4	12	24	57	89	100
5	18	29	57	67	100
6	12	33	50	72	97
7	12	24	68	83	97
8	59	90	100	100	97
9	0	52	71	89	97

46% of the students in the third quintile mastered objective one

Student Problem Solving Package Version 2.0 on the IBM-PC (SPP)

A Student-Problem Response Pattern Analysis Program

Delwyn L. Harnisch
Brian Malcolm
Neil Romy

Introduction

The SPP on the PC is a collection of three subprograms for analyzing item response patterns. These analyses are based on Student-Problem (S-P) curve theory. The SPP User's Guide provides (1) a brief introduction to response pattern analysis, (2) an overview of the sub-program capabilities, and (3) descriptions of the type of input data required as well as the output generated.

Response Pattern Analysis

SPP is designed to analyze the item response patterns of student test data. It provides analyses of response patterns for students as well as for items. Response patterns consist of each student's responses (correct or incorrect, or with the skill analysis, mastered, not mastered, and review suggested) to each item on a test. Analyzing the extent to which patterns are unusual may yield important information about student's preparation as well as about item characteristics. This information is not contained in the total test score (same number-right score).

Response patterns for students are unusual to the extent that students answer some easy items incorrectly while answering some more difficult items correctly. A wide variety of factors may lead to an unusual response pattern. These include guessing, carelessness, test anxiety, an unusual instructional history or other experimental background, a localized misunderstanding that influences responses to a subset of items, or copying a neighbor's answers to certain questions.

Response patterns for items are unusual to the extent that items are answered incorrectly by high scoring students (i.e., high total test score) and correctly by low scoring students. This situation suggests random responses by students, or something unusual about the content of an item, e.g., its wording or the nature of what is being asked.

The S-P Chart, the associated S-P curves, and various indices such as the modified caution index are very useful for diagnosing student performance, for detecting aberrant response patterns, and for assessing the quality of a test or instructional sequence.

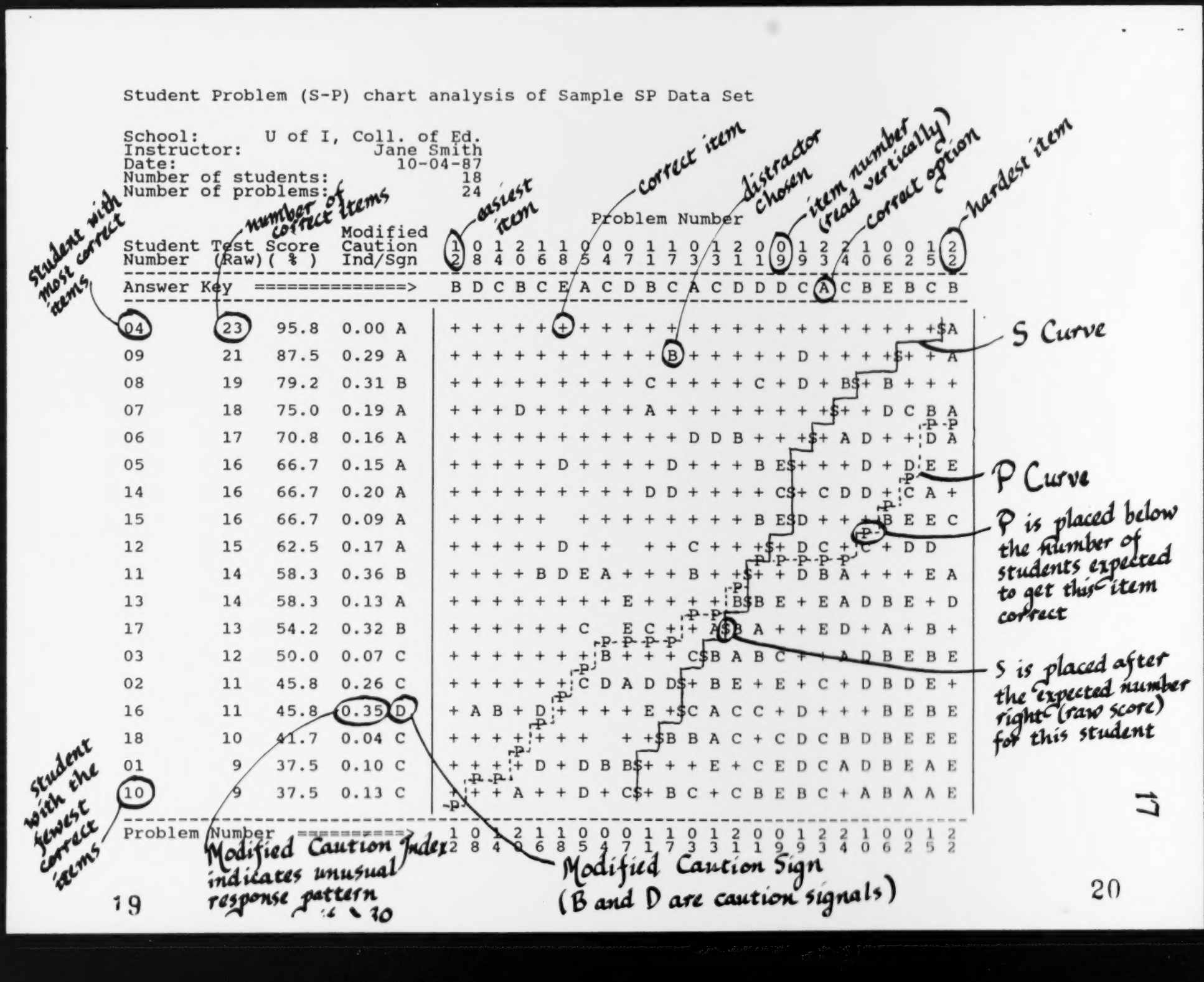
Overview of the Sub-Programs

SPP consists of three sub-programs which generate (1) a variety of statistical indices measuring the degree to which response patterns for individuals or items are unusual, and (2) related charts and tables.

One option generates S-P curves within the outputted responses. This is useful for determining the irregularity of both the students' responses and the problems. Another option does not generate S-P curves, but can use a larger data set. Finally, the third option allows the items to be grouped into similar content categories.

All of the options can be run on objectives, as well as with items. That is, individual items can be grouped together and treated as a single unit. Three levels of proficiency are allowed for each objective/skill which are: Low (Not Mastered), Middle (Review Suggested), and High (Mastered). The students are arranged on the chart from the highest to the lowest in terms of the number of skills in which their performance was high. Skills are arranged from the easiest (those on which the most students have a high proficiency) to the hardest skill (those on which the fewest students scored high).

IBM-PC, XT, AT, XT/286, PS/2 or 100% compatible
256k internal memory (more memory is recommended)
1 floppy disk (A hard disk is strongly recommended)
DOS 2.0 or greater
(A line printer is strongly recommended)


Student Problem (S-P) chart analysis of Sample SP Data Set
School: U of I, Coll. of Ed.
Instructor: Jane Smith
Date: 10-04-87
Number of students: 18
Number of problems: 24
Student with most correct items
number correct items
easiest item
correct item
distractor chosen
item number (read vertically)
correct option
hardest item
Problem Number
Student Number
Test Score (Raw) (%)
Modified Caution Ind/Sgn
Answer Key ==========>
S Curve
P Curve
P is placed below the number of students expected to get this item correct
S is placed after the expected number right (raw score) for this student
Student with the fewest correct items
Problem Number ==========>
Modified Caution Index indicates unusual response pattern
Modified Caution Sign (B and D are caution signals)
19
20
17

Student Problem (S-P) chart analysis of Sample SP Data Set

**** STUDENT SUMMARY ****

Average raw score	= 14.67
Standard deviation of raw score	= 4.01
Average percent of items correct	= 61.11
Average modified caution index	= 0.18
Standard deviation of modified caution index	= 0.11

**** PROBLEM SUMMARY ****

Average item difficulty (%)	= 61.11
Standard deviation of item difficulty	= 3.89
Average modified caution index	= 0.23
Standard deviation of modified caution index	= 0.15

**** TEST SUMMARY ****

Average overall student performance on test (%)	= 61.11
Reliability coefficient (Cronbach's alpha)	= 0.74
Disparity coefficient	= 0.58

around .5 is 'about right'.
above .6 is a danger signal
(S and P curves are too far apart)

**** PROBLEM STATISTICS ****

easiest item

Permuted Problem Number	Answer Key	Problem Total	Percent Correct	Modified Caution Ind/Sgn	
12	B	18	100.0	0.00	Y
8	D	17	94.4	0.14	Y
14	C	17	94.4	0.14	Y
20	B	16	88.9	0.35	Z
16	C	15	83.3	0.17	Y
18	E	14	77.8	0.52	Z
5	A	13	72.2	0.13	Y
4	C	12	66.7	0.13	Y
7	D	12	66.7	0.17	Y
11	B	12	66.7	0.50	Z
17	C	12	66.7	0.40	Z
3	A	11	61.1	0.24	Y
13	C	11	61.1	0.15	Y
21	D	10	55.6	0.14	Y
1	D	9	50.0	0.28	W
9	D	9	50.0	0.17	W
19	C	9	50.0	0.36	X
23	A	9	50.0	0.14	W
24	C	9	50.0	0.36	X
10	B	8	44.4	0.19	W
6	E	7	38.9	0.15	W
2	B	6	33.3	0.13	W
15	C	4	22.2	0.10	W
22	B	4	22.2	0.52	X

(Z and X are danger signals)

hardest items

correct option

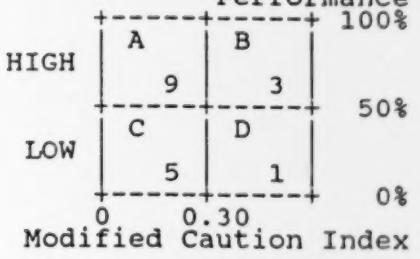
number of students getting item correct

indicates item 22 is performing strangely for this group (if >.30)

Student Problem (S-P) chart analysis of Sample SP Data Set

**** CLASSIFICATION AND FREQUENCY ****
**** DISTRIBUTION TABLES ****

(1) Number of students in each cell classified by test performance and modified caution index



Student Cell	Percent Correct	Modified Caution Index
A	> 50%	<= 0.30
B	> 50%	> 0.30
C	<= 50%	<= 0.30
D	<= 50%	> 0.30

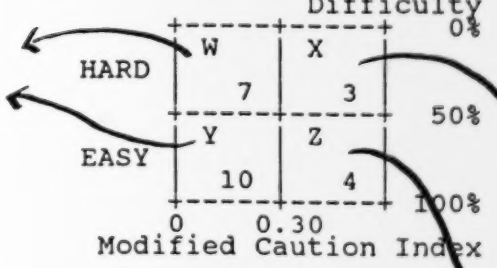
doing fine

high scores but unusual response pattern

low scores but pattern of responses as expected

low scores and unusual response pattern

(2) Number of items in each cell classified by item difficulty and modified caution index



Item Cell	Percent Correct	Modified Caution Index
W	<= 50%	<= 0.30
X	<= 50%	> 0.30
Y	> 50%	<= 0.30
Z	> 50%	> 0.30

good items

hard items

easy items

} but should be reconsidered

Reading the Student-Problem Skill Profiles

Introduction

The Student-Problem (S-P) skill profile is designed to be most useful to the teacher at the classroom level. A properly informed teacher can have at his/her fingertips a wealth of information regarding his/her own students. If these skill profiles are made available at the beginning of a school year, teachers will be able to use the information for instructional planning purposes in anticipation of the students' skill levels. The data are, of course, only one variable in instructional decision-making, so the profiles must be used with care and considered as simply a barometer of student achievement.

The three skill levels of high (+), medium (M), and low (L) are used in creating the S-P chart. The method for establishing these proficiency levels at the skill level is based on the respective item information from the national norming sample. Those students receiving an 'L' scored in the bottom 30% of the skill distribution as compared to the national norming sample. Those receiving an 'M' scored in the middle 40% and those receiving a '+' (high) scored in the top 30%. Each skill is measured on the average by approximately 8 to 10 test items.

The Student-Problem (S-P) Chart Analysis

Page one of the S-P Chart is simply a legend numbering the skills. For example, skill 1 is Synonyms. It falls under the content domain of Vocabulary, which is classified under the Language and Reading section of the Survey of Basic Skills (SRA). Skill 23 is Decimals. Its content domain is Concepts under the Math section of the test battery.

The second page of the S-P Chart ranks the students from the one who received the most high scores (+), to the one who received the fewest. The skills are ranked from left to right, the easiest skills for this classroom (those on which the most students scored high) to the hardest skills (those on which the fewest students scored high). Note that for this classroom, skill 18 (read vertically) is the easiest and skill 6 is the hardest. At the bottom of the chart is the total number of students scoring high for each skill (again read vertically). Thirteen students scored high on skill 18. Note also that the first student scored high on all skills except 29 (where she scored medium) and skill 10 (where she scored low).

The first column of the chart contains the students' names. the second is the raw score, i.e. the number of skills on which each scored high. The third column is the percent of the skills that the student scored high on. Note that the first student was assessed as high on 30 out of 32 skills, and 30/32=.94, or 94%.

The fourth column is the Modified Caution Index (MCI). An index of .30 or less means that the student's proficiency pattern on the skills is in a pattern consistent with the rest of the class. An indicator greater than .30 means the student has an

inconsistent proficiency pattern on the skills, and his total skill score should be considered with caution. For example, look at the fourth student, Carol. Most of the highs are on the easiest skills for this class, and mediums on the skills that are more difficult for this class, and her MCI is .14. Now look at Robert (with a raw score of 15). The highs, mediums, and lows are interspersed, and his MCI is .36. He is answering correctly many of the items in skills his classmates are finding difficult (for example those questions grouped under skill 25) and yet missing problems in skills his classmates on the whole find easy (like skills 3 and 4).

The fifth column is the Modified Caution Sign (MCS). This is an aid for quickly picking out those students with unusual patterns of scores. An 'A' signifies an adequate total skill score (scoring high on greater than 30% of the skills) and a consistent skill proficiency pattern (MCI < .30). Doug had only two medium scores (for skills 7 and 24) nestled within most of the highs, and he received a MCI of .19.

A 'B' signifies an adequate total skill score but an inconsistent skill proficiency pattern (MCI > .30). Robert has high scores all along the continuum. He did well on skills 24, 29, and 5 when most others did not, yet he did poorly on skills 16 and 26, relatively easy ones for the rest of the class. Possible causes of 'B' classification could be sporadic study habits, illness during the time the skill was covered in class, carelessness, or a common misunderstanding on a particular skill.

A 'C' signifies a low total skill score (< 30%) and a consistent skill proficiency pattern (MCI < .30). Sandra scored high on only 28% of the skills, but most of those were skills the rest of the class also found easy (skill 25 was the exception), so her MCI was .26.

A 'D' signifies a low total skill score (<30%) and an inconsistent skill proficiency pattern (MCI > .30). Lillian received a high on three skills with a high on skills 29 and 10, skills that were very difficult for most of the students in this class. She may have test anxiety, been ill on the day of testing, have poor test taking skills, a short attention span, or possibly the test has found a couple of her hidden strengths, certainly something a teacher would want to note.

The S-P Curves

The S-Curve provides a visual display of the proficiency level of the students in the classroom. See page 4 of the S-P Charts for an example. First S's are placed on each line after the number of skills that student scored high on. (Note that Donna has a skill raw score of 3, and the S on her line is after the third easiest skill.) The S-Curve is then created by drawing vertical lines through the S's and connecting them. A vertical S-Curve represents a homogeneous classroom based on these assessed skills, where a diagonal S-curve is evidence of a heterogeneous classroom performance on the test. (A heterogeneous classroom performance is one in which a few

students score high and low and the majority are in the middle.) An S-Curve shifted to the right shows a high proficiency level in the classroom.

The P-Curve is created by placing a P in each column at the point that matches the number of students scoring high on that skill. Then the P's are connected with horizontal lines to form the P-curve. In an ideal classroom (one in which everything taught is learned at a high proficiency level and everything tested is taught) the S- and P-curves would coincide. It is quite common to have the S and P curves diverge a little from each other. The individual differences commonly observed in the classroom provide inconsistent response patterns which force the divergence. If the test is measuring skills not covered in the classroom, the divergence will be increased. A large divergence between the S- and P-surves signals a possible mismatch of test objectives and instructional objectives in the classroom.

What the S-P Chart Can Tell a Classroom Teacher

For the class as a whole: the skills on the left are understood by more of the class and can be considered their strengths. The last few skills need extra review and concentration in the coming school year. Referring to the legend on page 1, for this classroom, most of these weaker skills are classified as Language/Reading, specifically Synonyms, Global and Inferential Reading Comprehension, Punctuation, and Nouns and Pronouns.

On the individual level: the chart can be used to pinpoint problem areas for concentrated work. Students with certain strengths can be easily spotted and paired with those who need help, for peer tutoring. For example, Sandra is very strong in computation and concepts (skills 17, 19, 21, and 22), and could benefit in many ways from tutoring those needing math help. Robert, Jerry, and Lillian have Modified Caution Signs of B or D. The skill proficiency patterns and total skill scores of these three students should be considered carefully. Possible causes for B and D Modified Caution Signs are listed in the preceding section.

The Categorized Individual Skill Profile

On page 3, the same information is displayed in a different manner. Here the skills are grouped into content domains to more closely match the way teachers organize their instructional time and materials. The skills are still listed at the top of each column read vertically. The content domains are ranked left to right from easiest to hardest. This is done using the average percent of the class that score high on each content domain, as seen at the bottom of each column. At the bottom of the page is a legend of the content domain and the abbreviations used. Note that Math Computation (MCP) is the easiest content area for the class, and Language Mechanics (LM) is the hardest. For MCP, 57.4% of the class scored high on its three skills combined. Above this line is a listing of the number of students scoring

high on each skill (read vertically). Within each content domain the skills are ordered easiest to hardest.

With this form an organization of major content domains can be seen and studied. Look again at the average percents per domain at the bottom. Since only 30% of the class is expected to score high in any content domain (since 30% of the national norm sample would score high in an area), any domain where the class averaged higher than 30% could be considered a strength. In this class only one content domain is lower than would be expected, Language Mechanics (LM), with an average of 27.8%. This would be an area to concentrate on during the instructional year. The information is useful at the student level as well. It is more obvious here that Diana has an unusual strength in Math Problem Solving, a fact not as evident on the first form, but explicit given the +++M pattern in this content area, while being relatively weak in reference materials, as noted with the LLLL pattern.

STUDENT-PROBLEM (S-P) CHART ANALYSIS OF 1986 SRA SKILLS FOR GRADE ????

SCHOOL CODE = KING GEORGE ; CLASSROOM CODE = M.SMITH

NUMBER OF STUDENTS = 18; NUMBER OF SKILLS = 32

SKILL NUMBER LEGEND

LANGUAGE AND READING

VOCABULARY
1. SYNONYMS
2. NONLITERAL MEANINGS
3. ANTONYMS

READING COMPREHENSION
4. LITERAL
5. GLOBAL
6. INFERENTIAL
7. ANALYTICAL

LANGUAGE MECHANICS
8. PUNCTUATION
9. CAPITALIZATION

LANGUAGE USAGE
10. NOUNS AND PRONOUNS
11. VERBS
12. MODIFIERS AND CONJUNCTIONS
13. WRITING SKILLS

SPELLING
14. VOWELS AND CONSONANTS
15. AFFIXES
16. COMMON ERRORS

MATH

COMPUTATION
17. WHOLE NUMBERS AND MONEY
18. DECIMALS
19. FRACTIONS AND MIXED NUMBERS

CONCEPTS
20. WHOLE NUMBERS AND MONEY
21. FRACTIONS
22. DECIMALS
23. GEOMETRY AND MEASUREMENT

PROBLEM SOLVING
24. ONE STEP; WHOLE NUMBERS/MONEY
25. ONE STEP; FRACTIONS/DECIMALS
26. MULTIPLE STEP PROBLEMS
27. GEOMETRY, MEASUREMENT, STATISTICS
28. PROBLEM SOLVING SKILLS

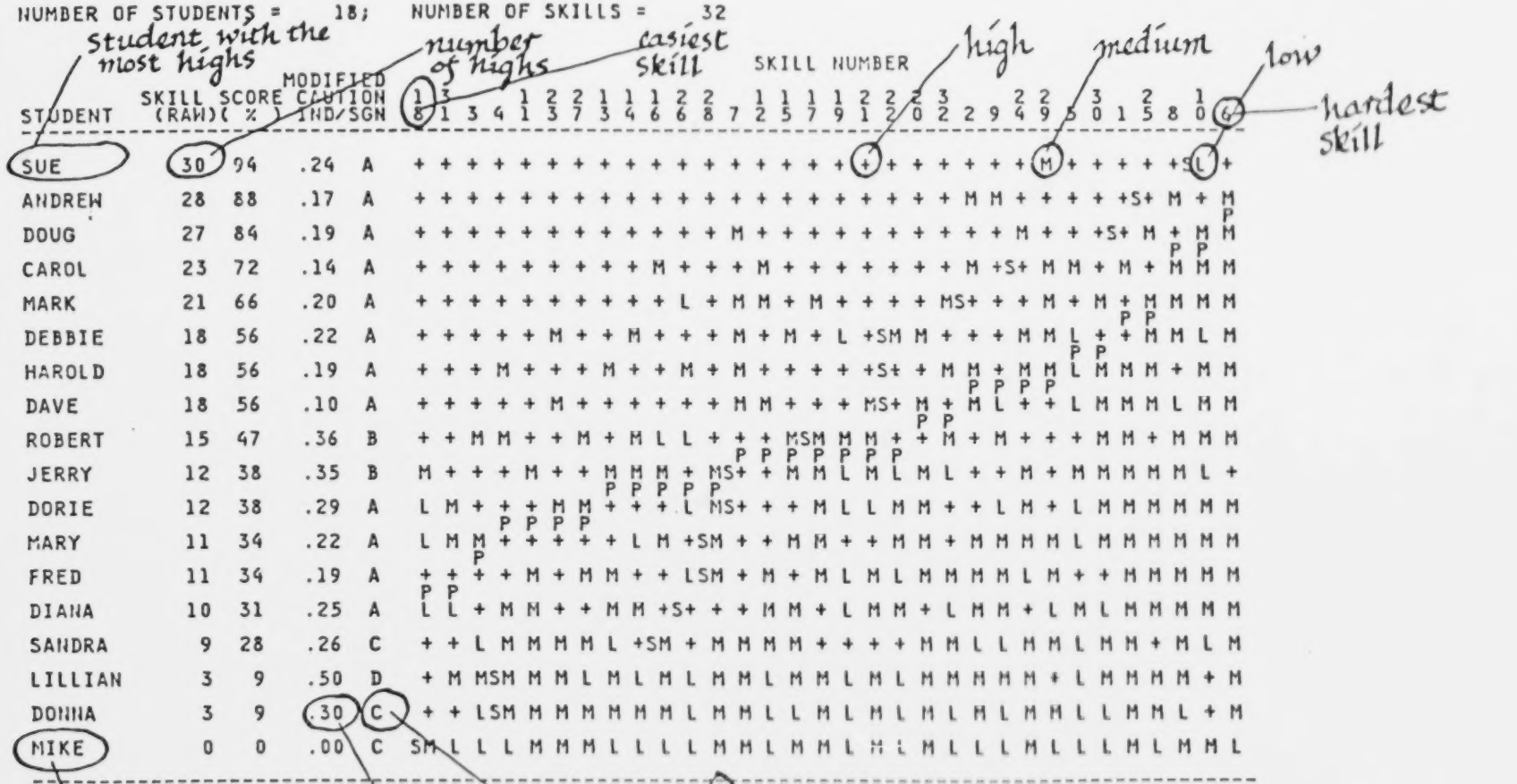
REFERENCE MATERIALS

29. RESEARCH SKILLS
30. DICTIONARY SKILLS
31. PARTS OF A BOOK
32. MAPS AND TABLES

STUDENT-PROBLEM (S-P) CHART ANALYSIS OF 1986 SRA SKILLS FOR GRADE ????

SCHOOL CODE = KING GEORGE ; CLASSROOM CODE = M.SMITH

NUMBER OF STUDENTS = 18; NUMBER OF SKILLS = 32


student with the most highs
number of highs
easiest skill
high
medium
low
hardest skill
SKILL NUMBER
STUDENT
SKILL SCORE (RAW) (%)
MODIFIED CAUTION IND/SGN
SUE 30 94 .24 A
ANDREW 28 88 .17 A
DOUG 27 84 .19 A
CAROL 23 72 .14 A
MARK 21 66 .20 A
DEBBIE 18 56 .22 A
HAROLD 18 56 .19 A
DAVE 18 56 .10 A
ROBERT 15 47 .36 B
JERRY 12 38 .35 B
DORIE 12 38 .29 A
MARY 11 34 .22 A
FRED 11 34 .19 A
DIANA 10 31 .25 A
SANDRA 9 28 .26 C
LILLIAN 3 9 .50 D
DONNA 3 9 .30 C
MIKE 0 0 .00 C
SKILL TOTAL
student with the fewest highs
Modified Caution Index
Modified Caution Sign
number of students scoring High on this skill

CATEGORIZED INDIVIDUAL SKILL PROFILE OF 1986 SRA SKILLS FOR GRADE ???? PAGE 3

SCHOOL CODE = KING GEORGE ; CLASSROOM CODE = M.SMITH

NUMBER OF STUDENTS = 18; NUMBER OF SKILLS = 32

skill 11: easiest skill in this content domain

skill 10: hardest skill in this content domain

easiest content domain

STUDENT	SKILL SCORE (RAW)	(%)	MODIFIED CAUTION IND/SGN		111 111 879	111 465	2222 3120	22222 76845	3323 1290	1111 1110	321	4756	98
								CONTENT DOMAIN					
					MCP	SPL	MCN	MPS	RM	LU	VOC	RCP	LM
S E	30	94	.24	A	+++	+++	++++	+++++	++M+	+++L	+++	++++	++
A REW	28	88	.17	A	+++	+++	++++	+++++	++++	++++	+M+	+++M	MM
DOUG	27	84	.19	A	+++	+++	++++	+++MM	++++	+++M	+++	+M+M	++
CAROL	23	72	.14	A	+++	+M+	++++	+++++	++M+	++MM	+MM	++MM	+M
MARK	21	66	.20	A	+M+	+++	++++	+L++M	+MMM	++MM	+++	+M+M	+M
DEBBIE	18	56	.22	A	++L	M+M	M+MM	+++MM	++M+	+++L	+++	+MLM	+M
HAROLD	18	56	.19	A	+++	+++	++++	+M+MM	+MMM	+M+M	+MM	MMLM	++
DAVE	18	56	.10	A	+++	+++	MM+M	++++M	+++M	++MM	+MM	+MLM	LL
ROBERT	15	47	.36	B	+MM	MLM	+M++	ML+++	+M+M	+++M	M+M	M++M	MM
JERRY	12	38	.35	B	MML	MMM	+MLM	++MMM	+L+M	MM+L	++M	++M+	+M
DORIE	12	38	.29	A	LML	+++	MLMM	MLMMM	M++M	+++M	++M	++LM	LM
MARY	11	34	.22	A	LM+	LMM	++MM	++MMM	M+MM	+++M	MMM	++LM	MM
FRED	11	34	.19	A	+ML	+++	+MLM	MLMLM	+MM+	MMMM	+MM	+++M	MM
DIANA	10	31	.25	A	L+L	M+M	+MM+	++++M	LLLL	MMMM	+MM	M+MM	MM
SANDRA	9	28	.26	C	+++	+MM	M++M	M+MM+	+MMM	MLML	LLM	MMLM	LM
LILLIAN	3	9	.50	D	+ML	LMM	MMLM	LLMMM	MM+M	MML+	MMM	MMLM	MM
DONNA	3	9	.30	C	+ML	MML	MMLM	MLMMM	+LML	MML+	LMM	MMLM	LL
MIKE	0	0	0.00	C	MML	LLM	MMLM	MLMML	LLLL	MLLM	LLM	LMLL	LM
TOTAL SCORING HIGH ON SKILL					1 399	11 009	1 1998	111 10075	1 3876	11 1093	1 275	1 1962	73
AVERAGE PERCENT - DOMAIN					67.4	53.7	51.4	47.8	47.2	45.8	44.4	38.9	27.8

unexpected strength

relatively weak area

hardest content domain

lower than would be expected (should be ≥ 30 %)

LEGEND ! VOC = VOCABULARY ! RCP = READING_COMPRE
! LM = LANGUAGE_MECHANICS ! LU = LANGUAGE_USAGE
! SPL = SPELLING ! MCP = MATH_COMPUTATION
! MCN = MATH_CONCEPTS ! MPS = MATH_PROBLEM_SOLVING
! RM = REFERENCE_MATERIALS

thirteen students scored high on skill 18

% of class scoring high in this content

STUDENT-PROBLEM (S-P) CHART ANALYSIS OF 1986 SRA SKILLS FOR GRADE ????

SCHOOL CODE = KING GEORGE ; CLASSROOM CODE = M.SMITH

NUMBER OF STUDENTS = 18; NUMBER OF SKILLS = 32

SKILL NUMBER

STUDENT	SKILL (RAW)	SCORE (%)	MODIFIED CAUTION IND/SGN		13 18	13	13	12 14	12 13	22 37	11 13	11 14	11 16	12 26	22 28	17	11 12	11 15	11 17	11 19	12 21	22 20	23 02	22	29	22 24	22 29	30 05	30 01	25	25	10 06
SUE	30	94	.24	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	S	L	+
ANDREW	28	88	.17	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	M	+	+	+	+	S	+	M	+	M
DOUG	27	84	.19	A	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	M	+	+	+	S	+	M	+	M	M
CAROL	23	72	.14	A	+	+	+	+	+	+	+	+	M	+	+	+	M	+	+	+	+	+	+	+	+	M	+	S	+	M	M	+	M	+	M	M
MARK	21	66	.20	A	+	+	+	+	+	+	+	+	+	L	+	M	M	+	M	+	+	+	+	M	S	+	+	+	M	+	M	+	M	M	M	M
DEBBIE	18	56	.22	A	+	+	+	+	+	M	+	+	M	+	+	+	M	+	M	+	L	+	S	M	M	+	+	+	M	M	L	+	+	M	M	L	M
HAROLD	18	56	.19	A	+	+	+	M	+	+	+	M	+	+	M	+	M	+	+	+	+	+	S	+	+	M	M	+	M	M	L	M	M	M	+	M	M
DAVE	18	56	.10	A	+	+	+	+	+	M	+	+	+	+	+	+	M	M	+	+	+	M	S	+	M	+	M	L	+	+	L	M	M	M	L	M	M
ROBERT	15	47	.36	B	+	+	M	M	+	+	M	+	M	L	L	+	+	+	M	S	M	M	M	+	+	M	+	M	+	+	+	M	M	+	M	M	M
JERRY	12	38	.35	B	M	+	+	+	M	+	+	M	M	M	+	M	S	+	+	M	M	L	M	L	M	L	+	+	M	+	M	M	M	M	M	L	+
DORIE	12	38	.29	A	L	M	+	+	+	M	M	+	+	+	L	M	S	+	+	+	M	L	L	M	M	+	+	L	M	+	L	M	M	M	M	M	M
MARY	11	34	.22	A	L	M	M	+	+	+	+	+	L	M	+	S	M	+	+	M	M	+	+	M	M	+	M	M	M	M	M	L	M	M	M	M	M
FRED	11	34	.19	A	L	+	+	+	M	+	M	M	+	+	L	S	M	+	M	+	M	L	M	L	M	M	M	M	M	L	M	+	+	M	M	M	M
DIANA	10	31	.25	A	L	L	+	M	M	+	+	M	M	+	S	+	+	+	M	M	+	L	M	M	+	L	M	M	+	L	M	L	M	M	M	M	M
SANDRA	9	28	.26	C	+	+	L	M	M	M	M	L	+	S	M	+	M	M	M	M	+	+	+	+	M	M	L	L	M	M	L	M	M	+	M	L	M
LILLIAN	3	9	.50	D	+	M	M	S	M	M	M	L	M	L	M	L	M	M	L	M	M	L	M	L	M	M	M	M	M	+	L	M	M	M	+	M	
DONNA	3	9	.30	C	+	+	L	S	M	M	M	M	M	M	L	M	M	L	L	M	L	M	L	M	L	M	M	M	L	L	M	M	L	+	M		
MIKE	0	0	.00	C	S	M	L	L	L	M	M	M	L	L	L	L	M	M	L	M	M	L	M	L	M	L	L	L	M	L	L	L	M	L	M	M	L
SKILL TOTAL					13	13	11	11	11	10	10	10	10	10	10	9	9	9	9	9	9	9	8	8	7	7	7	7	6	6	5	5	3	3	2		

S Curve

P Curve

S is placed after the expected number right (raw score) for each student.

P is placed below the number of students expected to score 'high' on each skill.

ITEMBANK

An Item Bank Package for the IBM PC*

Delwyn L. Harnisch

Dave Rotheroe

Features

The Item Bank Package is a comprehensive item bank. A sample of its many features include:

- True / False, Multiple Choice, Short Answer, and Essay Questions can be accommodated along with answers.
- Content domains and behavior categories exist for item classification.
- Most menus have instant action. You need only press the appropriate key, not the ENTER key as well.
- Items and tests are displayed on the screen in the same format as they are printed.
- Each item file can have hundreds of items and there is no limit to the number of item files which can be used.
- Items can be printed for easy reference, or displayed on the screen.
- Statistical data is stored for each item and with each test enabling performance on a test to be predicted.
- Stored items can be selectively incorporated into a test and a powerful editor allows for easy manipulation of tests.
- Material other than the items themselves can be easily added to a test.
- Test questions are kept numbered automatically, even if the order of the questions changes.
- Multiple forms of the same test can be easily created by scrambling or ordering the test questions manually or automatically.
- Tests and answer keys can easily be printed or displayed. Cross references between different forms of the same test can be generated automatically.

This manual describes and explains the commands available in the Item Bank Package.